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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/803,426

03/09/01

MORTENSEN

B

0300-0016

023980

HM12/1025

REED & ASSOCIATES

800 MENLO AVENUE

SUITE 210

MENLO PARK CA 94025

EXAMINER

TRAN, M

ART UNIT

PAPER NUMBER

1641

DATE MAILED:

10/25/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/803,426

Applicant(s)

MORTENSEN ET AL.

Examiner

My-Chau T. Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 July 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) 1-25 and 38-44 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 26-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-44 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-25, drawn to a method for detecting the proximity, classified in class 435, subclass 4.
 - II. Claims 26-37, drawn to a composition of a binding pair direct or indirect attachment, classified in class 435, subclass 7.1.
 - III. Claims 38-43, drawn to a compound covalently bound to a fluorophore, classified in class 436, subclass 501.
 - IV. Claim 44, drawn to an improvement for a FRET-based assay, classified in class 436, subclass 172.

The inventions are distinct, each from the other because of the following reasons:

2. Invention of groups I, II, III and IV are unrelated and independent inventions. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions as claimed have different modes of operation. The feature of a method for detecting the proximity of group I is not required by the claims of the other groups. The feature of a composition of a binding pair of group II is not required by the claims of the other groups. The feature of a compound of group II is not required by the claims of the other groups. The feature of an improvement for a FRET-based assay of group IV is not required by the claims of the other groups.

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3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with Mark A. Wilson on 10/9/01 a provisional election was made with traverse to prosecute the invention of Group II, claims 26-37. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-25 and 38-44 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.
5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Information Disclosure Statement

6. It is noted in the "Response to Notice to File Missing Parts" filed 07/23/01 applicant has indicated that the information disclosure statement under 37 CFR 1.97, Forms PTO-1449, and copies of cited reference have been submitted. However, copies of references and form 1449 are not found in the application.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 26, 27, and 33 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Bernard et al (Analytical Biochem, 255:101-107, 1998).

Referring to claim 26, Bernard et al disclosed a method using fluorescein and Cy5 as a dye-pair for fluorescence resonance energy transfer in the examination of the hybridization probes (pg. 101, right col. 2nd paragraph; pg. 102, left col., line 1-2 and 4-8). Pertaining to claim 33, Bernard et al also disclosed the use of this method for examining the resonance energy transfer between a Cy5-labeled PCR strand and a complementary fluorescein probe.

With respect to claim 27, Bernard et al further disclosed that Cy5 and fluorescein attachment to the probe is covalent by calculating the ratio of oligonucleotide concentration to the fluorophore concentration. If every oligonucleotide strand is fluorescently labeled and no free fluorophore is present, the ratio of the oligonucleotide concentration to the fluorophore concentration should be 1.0. (pg. 102, right col., line 17-18).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bernard et al in view of Lee et al (Analytical Biochemistry, 227: 295-301, 1995).

As noted above, Bernard et al disclosed a direct attachment of fluorescein and Cy5. Bernard et al do not explicitly disclose an indirect attachment of fluorescein and Cy5. Lee et al disclose that the fluorophore moieties are attached via a linker in order to confirm the absence of fluorescence quenching due to the probe-DNA interactions when the probe is introduced to the DNA via a longer linker arm (pg. 295, abstract; pg. 297, right col., line 5-10).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the composition of Bernard et al with a linker, as taught by Lee et al in order to confirm the absence of fluorescence quenching due to the probe-DNA interactions when the probe is introduced to the DNA via a longer linker arm.

13. Claims 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bernard et al in view of Chick et al. Bernard et al disclosed a method using fluorescein and Cy5 as a dye-pair for fluorescence resonance energy transfer. Bernard et al further fail to disclose using this composition to examine antibody-antigen, receptor-ligand, or enzyme-substrate. Chick et al disclose the use of fluorescence resonance energy transfer to examine antibody-antigen, receptor-ligand, or enzyme-substrate (col. 9, line 20-50).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the composition of Bernard et al with different combinations of binding pair as taught by Chick et al in order to examine the binding ability of either the antibody-antigen, receptor-ligand, or enzyme-substrate in a competitive assay.

14. Claims 34-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bernard et al in view of Dykens et al (US Patent 6,280,981 B1). Bernard et al teaches a method using fluorescein and Cy5 as a dye-pair for fluorescence resonance energy transfer. Bernard et al do not explicitly teaches the distance for fluorescence resonance energy transfer. Dykens et al teaches that the efficiency of the resonance energy transfer is dictated largely by the proximity of the donor and acceptor (col. 15, line 38-52). Dykens et al list the proximity distance in col. 31, line 1-9.

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Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the proximity distance to determine the resonance energy transfer. One would have been motivated to make such a modification of Bernard et al composition in view of the suggestion in Dykens et al that those familiar with the art will readily appreciate that donor-acceptor intermolecular distance is a cardinal determinative factor for the efficiency of the resonance energy transfer (col. 31, line 14-17).

Conclusion

15. No Claims are allowed.

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of the art with respect to fluorescence resonance energy transfer in general:

U.S. Pat. No. 6,037,130 to Tyagi et al.

U.S. Pat. No. 6,232,130 B1 to Wolf

U.S. Pat. No. 6,255,083 B1 to Williams

The following patents are cited to further show the state of the art with respect to energy transfer:

U.S. Pat. No. 6,140,494 to Hamilton et al. and U.S. Pat. No. 6,191,278 B1 to Lee et al.

The following patents are cited to further show the state of the art with respect to fluorescein and Cyanine 5 dyes in general:

U.S. Pat. No. 6,133,429 to Davis et al.

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U.S. Pat. No. 6,087,102 to Chenchik et al.

U.S. Pat. No. 6,171,794 B1 to Burchard et al.

U.S. Pat. No. 6,287,768 B1 to Chenchik et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to My-Chau T. Tran whose telephone number is 703-305-6999. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long V. Le can be reached on 703-305-3399. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-4242 for regular communications and 703-308-4242 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.



mct

October 22, 2001



LONG V. LE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600

10/22/01